

We claim:

1 1. A method of communicating data between a device and a
2 host apparatus through a USB interface comprising the steps of:
3 transmitting a first packet from the device to the host
4 apparatus, the first packet being erroneously recognized by the host
5 apparatus as a first type of packet;
6 receiving a second packet from the host apparatus at the
7 device in response to the first packet; and
8 transmitting a third packet from the device to the host
9 apparatus, the third packet being the first type of packet, in
10 response to receiving the second packet from the host apparatus.

1 2. The method of claim 1, wherein the first type of packet is a
2 STALL packet.

1 3. The method of claim 2, wherein the second packet is a clear
2 feature command packet.

1 4. The method of claim 3, wherein the method further
2 comprises the step of:
3 receiving a fourth packet from the host apparatus at the
4 device, the fourth packet being a clear feature command packet, the
5 fourth packet transmitted from the host apparatus in response to
6 receiving the third packet from the device..

1 5. The method of claim 4, wherein the method further
2 comprises the step of:
3 transmitting status information from the device to the host
4 apparatus, in response to receiving the fourth packet from the host
5 apparatus.

1 6. The method of claim 5, wherein a type of the first packet
2 transmitted from the device is an ACK packet or a NAK packet.

1 7. The method of claim 6, wherein the data communications is
2 performed using USB Mass Storage Class Bulk Only Mode.

1 8. A method of communicating data between a device and a
2 host apparatus through a USB interface comprising the steps of:
3 transmitting a first request for data from the host apparatus
4 to the device;
5 receiving a first packet from the device at the host apparatus
6 in response to the first request for data;

7 transmitting a second request for data from the host
8 apparatus to the device, in response to receiving the first packet
9 from the device; and
10 receiving a second packet from the device at the host
11 apparatus in response to the second request for data;

1 9. The method of claim 8, wherein the first packet is
2 transmitted from the device as an ACK packet or a NAK packet, but
3 the host apparatus erroneously recognizes the first packet as a
4 STALL packet.

1 10. The method of claim 9, wherein the second packet is a
2 STALL packet.

1 11. The method of claim 10, wherein the method further
2 comprises the step of:
3 transmitting a clear feature command packet from the host
4 apparatus to the device, in response to receiving the second packet
5 from the device..

1 12. The method of claim 11, wherein the method further
2 comprises the step of:
3 receiving status information from the device at the host

4 apparatus, the status information transmitted from the device in
5 response to receiving the clear feature command packet from the
6 host apparatus.

1 13. The method of claim 6, wherein the data communications is
2 performed using USB Mass Storage Class Bulk Only Mode.

1 14. A method of communicating data between a device and a
2 host apparatus through a USB interface comprising the steps of:
3 counting a number of STALL packets transmitted from the
4 device to the host apparatus;
5 counting a number of clear feature command packets
6 received from the host apparatus; and
7 determining a number of times a phase failure has occurred
8 based on the difference between the number of STALL packets
9 transmitted from the device to the host apparatus and the number of
10 clear feature command packets received from the host apparatus.

1 15. The method of claim 14, further comprising the step of:
2 using the number of times a phase failure has occurred to
3 perform self-diagnosis of the device.

1 16. The method of claim 15, wherein the step of using the
2 number of times a phase failure has occurred to perform self-
3 diagnosis of the device comprises the step of:
4 displaying an alarm on the device based on the number of
5 times a phase failure has occurred.

1 17. The method of claim 15, wherein the step of using the
2 number of times a phase failure has occurred to perform self-
3 diagnosis of the device comprises the step of:
4 displaying an alarm on the host apparatus based on the
5 number of times a phase failure has occurred.

1 18. In a device operable to communicate data with a host
2 apparatus through a USB interface, apparatus comprising:
3 a packet detector operable to detect a second packet from the
4 host apparatus, the second packet transmitted from the host device
5 in response the host device receiving a first packet from the device,
6 the first packet being erroneously recognized by the host apparatus
7 as a first type of packet; and
8 a packet transmitter operable to transmit a third packet to the
9 host apparatus, the third packet being the first type of packet, in
10 response to receiving the second packet from the host apparatus.

1 19. The apparatus of claim 18, wherein the first type of packet is
2 a STALL packet.

1 20. The apparatus of claim 19, wherein the second packet is a
2 clear feature command packet.

1 21. The apparatus of claim 20, wherein the packet detector is
2 further operable to receive a fourth packet from the host apparatus,
3 the fourth packet being a clear feature command packet, the fourth
4 packet transmitted from the host apparatus in response to receiving
5 the third packet from the device..

1 22. The apparatus of claim 21, further comprising:
2 circuitry operable to transmit status information to the host
3 apparatus, in response to receiving the fourth packet from the host
4 apparatus.

1 23. The apparatus of claim 22, wherein a type of the first packet
2 transmitted from the device is an ACK packet or a NAK packet.

1 24. The apparatus of claim 23, wherein the data communications
2 is performed using USB Mass Storage Class Bulk Only Mode.

1 25. In a host apparatus operable to communicate data with a
2 device through a USB interface, apparatus comprising:
3 transmitting circuitry operable to transmit a first request for
4 data to the device;
5 receiving circuitry operable to receive a first packet from the
6 device in response to the first request for data;
7 transmitting circuitry operable to transmit a second request
8 for data to the device, in response to receiving the first packet from
9 the device; and
10 receiving circuitry operable to receive a second packet from
11 the device in response to the second request for data.

1 26. The apparatus of claim 25, wherein the first packet is
2 transmitted from the device as an ACK packet or a NAK packet, but
3 the host apparatus erroneously recognizes the first packet as a
4 STALL packet.

1 27. The apparatus of claim 26, wherein the second packet is a
2 STALL packet.

1 28. The apparatus of claim 27, wherein the apparatus further
2 comprises:
3 transmitting circuitry operable to transmit a clear feature
4 command packet to the device, in response to receiving the second
5 packet from the device..

1 29. The apparatus of claim 28, wherein the apparatus further
2 comprises:
3 receiving circuitry operable to receive status information
4 from the device, the status information transmitted from the device
5 in response to receiving the clear feature command packet from the
6 host apparatus.

1 30. The apparatus of claim 29, wherein the data communications
2 is performed using USB Mass Storage Class Bulk Only Mode.

1 31. In a device operable to communicate data with a host
2 apparatus through a USB interface, apparatus comprising:
3 a counting unit operable to count a number of STALL
4 packets transmitted from the device to the host apparatus;
5 a counting unit operable to count a number of clear feature
6 command packets received from the host apparatus; and
7 a determining unit operable to determine a number of times a
8 phase failure has occurred based on the difference between the

9 number of STALL packets transmitted from the device to the host
10 apparatus and the number of clear feature command packets
11 received from the host apparatus.

1 32. The apparatus of claim 14, further comprising:
2 a self-diagnosis unit operable to use the number of times a
3 phase failure has occurred to perform self-diagnosis of the device.

1 33. The method of claim 15, wherein the self-diagnosis unit
2 comprises:
3 an alarm unit operable to display an alarm on the device
4 based on the number of times a phase failure has occurred.

1 34. The method of claim 15, wherein the self-diagnosis unit
2 comprises:
3 an alarm unit operable to display an alarm on the host
4 apparatus based on the number of times a phase failure has
5 occurred.